July 23rd, 2001

TO: Gearld Boyd
Dave Huizenga

SUBJECT: Ohio Field Office Progress Report – ***Pilot of Field Integration of the Technology Development and Pollution Prevention Programs***

This progress report is issued to document results of our pilot program requested in your attached joint memorandum issued on August 24, 2000.

It can be shown over half of the total Ohio Field Office (OH) budget is consumed in generating, handling, and disposing of waste. In order to concentrate our limited resources on this major area, OH began attempting the integration of our Technology and Pollution Prevention / Waste Minimization (P2/WMin) Programs in 1999. Your jointly requested Pilot Program led us to the final step of formally combining our Site Technology Coordination Group (STCG) with the P2/WMin Coordinators to form the Ohio Cost Savings Group (OCSG). The objective of the OCSG is to enhance OH Closure performance by bringing carefully chosen technologies to bear on P2/W Min opportunities to improve cost and/or schedule baselines. We believe this OH Pilot effort has been successful and has shown the following:

- Combining the Technology and P2 / W Min Programs improves both.
- The OCSG Process is fully developed and is ready for deployment within EM.

Combining the Technology and P2 / WMin Programs improves both.

As part of a recent P2 data call, the OCSG collected and analyzed the results of fifteen individual projects in OH having both an improved technology and a P2 /WMin component. A review of the cost savings or cost avoidance and the estimated waste volume reduction was made for each. The total estimated life cycle cost savings/avoidance for the fifteen projects exceeded **$80 million,** and the total waste volume reduction is projected to exceed **50,000 cubic meters.** No attempt was made to quantify the cost impact of the baseline schedule improvements resulting from these projects, but they are known to be significant.

These fifteen projects clearly demonstrate applying the best available technology to waste problems will produce cost and schedule improvements. A brief description of two representative projects from each OH site containing an improved technology applied to achieve P2/WMin is presented in ***Attachment A.*** Those not included in the fifteen projects discussed above are identified as **(not included).**

The OCSG Process is fully developed and is ready for deployment within EM.

The OCSG evolved from the simple realization that all five OH sites have contaminated soil and sludge, and the five sites were using different technical approaches to resolve their common problem. In order to promote communication and synergy between the five sites, a workshop devoted to OH soil and sludge problems was undertaken in 1998. Technical experts from the Office of Science and Technology (OST) and industry were invited to present the latest advances in treatment and disposal technologies to the appropriate technical and waste management personnel from the sites.

The evolution of the OCSG from this initial effort in 1998 is detailed in the chronological listing of key events presented in ***Attachment B.*** The present OCSG is built around four teams of DOE and contractor participants from the five OH sites. The nucleus of each team consists of former OH-STCG members or P2/W Min Coordinators. A contractor leads each team with some supplemental funding provided by the technology and P2 national programs.

The OCSG combined the site technology needs with previously identified cost savings opportunities resulting in agreement on the selection of the four areas of concentration. These four particular areas were chosen because they best focus the needs and opportunities and cover most of the broad range of EM Projects. The four are:

- Characterization and Delineation of Contaminates
- Problem Waste Disposition
- Materials Management
- D & D Equipment, Processes, and Technologies

The ultimate objective of each team is to secure the assistance of a problem holder from each of the five sites, so that the teams jointly achieve optimum solutions to common problems. The role of the OCSG is to support, by all means available, the implementation of any joint decisions made by any of the teams.

The four teams were formed in November, 2000 with renewed support from OH management. In June of this year, D & D Project Managers from the five OH sites plus OCSG members joined together in a facilitated workshop which was the final step in the development of the OCSG concept. The workshop produced fourteen items with the potential to save time or money for two or more of the sites. Four of these common items were of immediate interest, and an action plan for each was developed at the meeting. The remaining ten items with common potential will be developed and worked by the D & D Team as a future activity.

The successful approach of the D & D Team will be duplicated with a similar workshop for each of the other three OCSG teams. Complete details on most of the OCSG

evolution including the report of the D & D Workshop can be found on the ***OCSG web page***, which can be accessed by clicking on ***Technology*** from the Ohio Field Office Home Page ***(www.ohio.doe.gov).*** A process flow chart depicting the steps taken to form the OCSG is also attached to this report as ***Attachment C.***

In summary, we believe our OH Pilot Project of Field Integration has shown combining Technology with P2/W Min can make greater improvements to cost and schedule baselines than either program can make independently. Further, we believe the OH approach could benefit most other EM organizations, and stand ready to assist any that wish to try it. Please contact Doug Maynor with any questions or if more information is needed. He can be reached at (937) 865-3986 or by e-mail at: doug.maynor@ohio.doe.gov

Sincerely

Susan

ATTACHMENT A

Examples of Successful OH Projects Combining Technology with P2/WMin

Ashtabula Environmental Management Project (AEMP)

Chemical Extraction Soil Washing System

AEMP is using an OST developed chemical extraction technology to leach uranium from soil. A full-scale plant was constructed to treat the uranium-contaminated soil believed to be the largest cost driver in the AEMP remediation. Soil washing with on site re-use has been shown to produce a savings of over $150 per ton when compared to the total life-cycle costs to ship and bury the soil. The plant is designed to reduce the volume of soil shipped off-site by over 90%. To date approximately 11,000 tons of contaminated soil has been processed. An Accelerated Site Technology Deployment (ASTD) Project to up-grade the plant and use it for other contaminates was funded this year. The ASTD required a validation of results before proceeding with the up-grade. The study verified the potential still remains to save more than **$5 million** even though the out-of-pocket cost to ship and bury has fallen from $900 per ton to $525 per ton under the OH Contract with Envirocare.

Life Cycle Analysis (LCA) for Treatment and Disposal of PCB Waste

AEMP hosted an LCA to determine the best methods for disposing of PCB contaminated wastes in OH. The P2 Program funded the study while OST provided technical expertise. The LCA recommended application of a provision in the new EPA Megarule to allow AEMP to directly dispose of some 12,000 cubic feet of PCB-contaminated soil without treatment. Cost avoidance of nearly **$4 million** can be achieved when compared to the initial approach of on-site treatment.

Columbus Environmental Management Project (CEMP)

Pipe Explorer Surveying System

An OST sponsored Value Engineering (VE) Study originally recommended the Pipe Explorer™ be used to characterize all underground lines suspected of radioactive contamination at the Battelle West Jefferson site. The traditional approach is to excavate all suspect lines. The ability to quantitatively characterize such lines has shown a significant amount of pipe can be left in place producing a significant reduction in the volume of soil requiring costly removal and disposal. This OST developed technology was deployed by CEMP at both their West Jefferson and King Avenue sites. These successful deployments showed using the Pipe Explorer™ system to survey the 8800 linear feet of remaining underground lines will conservatively save over **$5 million.**

Diamond Wire Sawing of a Reactor Bioshield

CEMP secured ASTD funding to modify and deploy the diamond wire sawing technology on an eight-foot-thick reactor bioshield at the Columbus West Jefferson site. The supplemental ASTD funding allowed the project to be started one year ahead of schedule. This innovative technology produced a waste volume of only 12,000 cubic feet rather than the 48,000 cubic feet of waste which would have resulted using the baseline approach of turning the concrete structure into rubble using jackhammers, track-hoes or other equipment. In addition to the documented **$221,000** in out-of-pocket cost savings, this technology allowed the project schedule to be significantly reduced and produced less worker exposure to dust and contamination.

Fernald Environmental Management Project (FEMP)

Integrated Technology Suite for Soils Characterization

This ASTD project is by far the most successful in OH and possibly in DOE. The project deployed a real-time soil characterization system utilizing gamma spectroscopy instrumentation, vendor available field deployable gamma ray detection devices, and commercially available software, communication, and surveying devices in an innovative fashion. The system is estimated to save **$34 Million** over the baseline technology. The Integrated Technology Suite for Soils Characterization has been deployed at Fernald since 1998. Savings of **$15 million** have already been realized from this innovative approach as of the end of Fiscal Year 2000. In addition to pollution prevention achieved by reduced sampling and analysis, significant volume reduction is realized by removing only contaminated soil.

Groundwater Re-injection Demonstration

Groundwater contaminated with uranium is moving off the FEMP site. With OST support, the Groundwater Re-injection technology has been deployed at the FEMP for treatment of groundwater. It is estimated re-injection will reduce the overall treatment time from 27 years for the baseline pump and treat remedy to 10 years when used in conjunction with an optimized extraction strategy. The baseline technology was estimated in February 2000 to cost $81.6M, compared to an estimated $67.3M cost of completion with use of the re-injection technology yielding a cost savings / avoidance of more than **$14 million**.

Miamisburg Environmental Management Project (MEMP)

Nochar Absorbent Polymer Oil Solidification Agent

Nochar Petro Bond Absorbent Polymer Oil Solidification Agent is a commercially developed product that solidifies and stabilizes mixed waste oils. It had not been used in DOE before being selected and deployed by the Tritium Large Scale Demonstration and Deployment Project (LSDDP). Nochar became an enabling technology to allow MEMP to treat and dispose of vacuum pump oil highly contaminated with tritium. The baseline would have been incineration if a facility permitted to discharge that amount of Tritium ever became available. Nochar provided a simple and effective disposal method for this mixed waste oil, which met the waste acceptance criteria (WAC) requirements for burial at the Nevada

Test Site (NTS). MEMP estimated savings of over **$1 million** was achieved by using this enabling technology to resolve this complex problem.

Recognizing the potential of this technology to resolve a complex waste management problem, OH submitted a P2-ROI proposal to promote the use of this product complex wide. The ROI proposal was funded as an ASTD project allowing OH to provide deployment assistance for the technology at Rocky Flats with TRU contaminated oil, Savannah River with PUREX solution, plus several other sites with oil related problems. OH is using the model developed at Fernald to deploy the "Cool Suits" and "Oxy-Gasoline Torch" to provide benefit across the complex with this ASTD project. International assistance has also been provided to the Atomic Energy of Canada facility in Manitoba and possible assistance in Russia is now being investigated. Cost benefits are difficult to estimate at this point, but are believed to be huge.

Disposition and Reuse of Contaminated Equipment

MEMP has effectively applied the process knowledge and methodology developed by the DOE National Center of Excellence for Metals Recycle (NMR) to re-use Tritium contaminated equipment at another facility. With assistance from the Tritium LSDDP, the DOE, NMR, and BWXTO jointly concluded a bartered sale and transfer of contaminated tritium processing equipment to a U.S. Nuclear Regulatory Commission (NRC) regulated facility in Texas for reuse in the pharmaceutical industry. The equipment was marked for disposal, with baseline costs expected to include packaging, shipping, and burial at a licensed radiological / mixed waste repository. DOE avoided **$400,000** in equipment disposal costs and estimates an additional **$1,000,000** cost avoidance will be realized by shortening the schedule for site closure. A report detailing the process used for this novel cost savings activity was prepared for the LSDDP and is available.

West Valley Demonstration Project (WVDP)

Vitrification Expended Material Processing (VEMP) Program

The West Valley Demonstration Project (WVDP) is successfully operating a system for vitrifying liquid high-level waste (HLW) resulting from a commercial nuclear fuel reprocessing operation. The site is owned by the State of New York. Operating the reprocessing facility resulted in generation of waste such as expended equipment and consumables within the shielded vitrification cell. These expended materials had been set aside for possible repair and reuse or eventual disposition. The accumulation of excess materials requires innovative tools and techniques for remote handling, size reduction, cleaning and packaging. An ASTD project was funded to deploy a number of tools developed or adapted from commercial equipment for use within the shielded cells. This project has achieved significant volume reduction of HLW. The life-cycle cost savings expected from this project will exceed **$4 million**.

Carbon Dioxide Surface Blasting

The WVDP has generated low-level wastes in support of its high-level waste vitrification program. A carbon dioxide blasting unit was deployed to decontaminate the surfaces of low-level waste forms. As a result of deploying this OST supported technology: 1) contaminated remote handling equipment was

restored for re-use; 2) greater than 21,000 pounds of mixed waste lead were decontaminated, with 16,000 pounds free released; and 3)more than 2,000 pounds of scrap metal were also decontaminated and free released. Total cost savings are estimated to exceed **$300,000.**

ATTACHMENT B

Chronology of Key Events in the Evolution Of the Ohio Cost Savings Group (OSCG)

The following is a chronology of activities and events critical to the formation of the present OCSG.

March 1998 – Seminar on Treatment and Volume Reduction Technologies

The OH Technical Program Officer (TPO) and the OH Waste Minimization Coordinator jointly sponsored a seminar to discuss the latest technologies available to treat and volume reduce OH wastes. The Mixed Waste Focus Area made presentations on their top six solidification/stabilization technologies. Presentations were also given on the Segmented Gate System for volume reduction by separation, the Ashtabula Soil Washing Process, and the Envirobrick Process to achieve volume reduction using compression molding. The objective was to bring technology and waste management personnel together to begin cooperative efforts.

April 1998 – OH Manager Authorizes the OH Combined Soils/Sludge Initiative

Based on the positive outcome of the above seminar, the OH Combined Soils/Sludge Initiative was undertaken to attack the largest volume waste stream in OH.

August 1998 – 2nd Annual Ohio Operations P2 Workshop: "Tools and Programs"

The P2 Program funded an OH workshop that brought together over sixty representatives from key P2 and Technology programs along with project personnel to discuss opportunities to reduce waste and save money.

November 1998 – Joint Facilitated Meeting held with Waste Integration Group

In November 1998 OH, with assistance from OST and the INEEL Waste Integration Team organized a facilitated meeting with waste management, technology and pollution prevention representatives from the five Ohio sites. The participants were given detailed presentations on several related subjects such as the Oak Ridge-Broad Spectrum Contract, intermodal transportation to NTS, and the status and projected availability of the three DOE incinerators. After the presentations, the participants began brain-storming to develop numerous suggestions for combined activities at multiple sites. These suggestions were organized into 22 Ohio-wide Cost Savings Initiatives in the following common areas: 1) Treating and Disposing of Mixed Wastes; 2) Removing and Disposing of Concrete Structures; 3) Packaging and Transporting Radioactive and Mixed Waste; 4) Processing Soils and Sludges; and 5) Reusing and Recycling Government Equipment.

January 1999 – OH Summit approves OH Cost Savings Initiative

The OH Summit Meeting where the DOE Site Managers and site contractor presidents meet with the OH Field Office senior managers approved the concept of OH Cost Savings Initiatives and authorized the STCG and P2 teams to begin work on several of the Initiatives.

January 1999 to October 2000 – Developed and Implemented Specific OH Cost Saving Initiatives

OH completed specific Cost Saving Initiatives between the five OH sites, including:

1) Established concrete crushing capability at MEMP through cost/benefit analysis and obtaining excess equipment from Hanford;
2) Transferred MEMP contaminated tritium processing equipment to a commercial company;
3) Transferred MEMP glove boxes and HEPA Filters to WIPP to accelerate a new national program;
4) Conducted PCB Life Cycle Analysis for Ashtabula and Fernald to apply the EPA Megarule, working with TMFA and EPA;
5) Assisted in ASTD Project for characterization of the MEMP Old Cave;
6) Expanded LSDDP deployment of Nochar from MEMP to other DOE sites (continuing);
Initiated process to recycle electronic equipment at MEMP and FEMP at zero DOE cost.

June 2000 – Initiate Redesign of the OH P2/Technology Web Site

In June, the work began on development of an area of the OH web site to include information relative to OCSG activities. OSTI was used to evolve the Interface 2000 web site concept into an information management vehicle for the OCSG. Access the site may be gained by clicking on **Technology** from the Ohio Field Office Home Page **(www.ohio.doe.gov).**

August 1999 – 3rd Annual OH P2 Workshop "Cost Savings Against The Baseline"

The P2 Program again funded the annual OH workshop, which was directly focused on cost savings. The meeting brought together over fifty representatives from key P2 and Technology programs and plus OH personnel to discuss opportunities to improve cost savings against the baseline. Key sessions included: 1) OH Cost Savings Initiatives; 2) DOE Headquarters and National Programs Perspectives; 3) P2 through Project Baseline Approaches for OH; 4) DOE Support Programs; and 5) P2 Internet and P2 in ER Training.

August 2000 – Joint Request for Pilot Integration of the Technology Development and Pollution Prevention Programs

On August 24 the Office of Science and Technology (EM-50) and the office of Integration and Disposition (EM-20) jointly proposed a pilot program to integrate the technology development and pollution prevention field programs to achieve greater effectiveness and efficiency in the operation of these programs. In this pilot program, EM-22 and EM-54 worked with OH, Savannah River, and Oak Ridge during FY 2001 to demonstrate different approaches for combining P2 and technology.

November 2000 – OCSG Working Meeting gives New Focus to Cost Savings Efforts

On November 8 - 9 the OCSG and Waste Management personnel from the five OH sites held a facilitated workshop. The group reviewed the sites' common needs and issues and refocused them into four major areas: 1) Characterization and Delineation of Contaminates; 2) Problem Waste Disposition; 3) Materials Management; and 4) D & D Equipment, Processes and Technologies. Each area provided a list of cost savings actions to be pursued.

November 2000 – OH Presentations at annual Technology Information Exchange (TIE) Workshop

On November 14, a special session was held at the TIE workshop entitled "Enhance Performance through Collaboration between Pollution Prevention Program and Office of Science and Technology". Managers from the Ohio Field Office, the Savannah River Site, and the Hanford site each gave presentations. OH provided an overview of the Ohio Cost Savings Group and provided examples of successes and future plans.

January 2001 – First OCSG Team Meetings Held

On January 30 - 31 the OCSG held its organizational meetings with the Characterization and Delineation of Contaminates (C & D) Team and the Problem Waste Disposition Team. The working team meetings brought site personnel together and presented them with "state-of-the –art" technology briefings on some of the EM-50 technologies which had been deployed in OH. The briefings, given by vendor subject matter experts, included the Pipe Explorer and Cone Penetrometer for the C & D Team. Presentations in the Problem Waste Area were given by Sepradyne on their thermal desorption process and by Earthline on their macro and mirco-encapsulation processes. After the morning briefings, the teams met independently to organize their efforts.

April 2001 – OCSG Second Focus Area Meeting

On April 4 - 5 the OCSG conducted the second team organizational meetings that focused on the Materials Management Team and the D&D Equipment, Processes and Technologies. Morning technical presentations included an update on innovative AEA Technologies from England, and Diamond Wire Sawing Technology, plus presentations by the National Metals Recycle Center in Oak Ridge, and on the Materials Exchange and OCSG web-sites. The afternoon was again devoted to organizing these last two teams.

June 2001 – D&D Project Managers / OCSG Working Meeting

On June 6 - 7 D & D Project Managers from the five OH sites plus OCSG members joined together in a facilitated workshop that represented the final step in the development of the OCSG concept. In this first meeting of the OCSG with project managers, fourteen suggestions that have the potential to save time or money for two or more OH sites were identified and agreed upon by the Team. Four of these were considered acceptable for immediate adoption, and an action plan for each was developed at the meeting. The remaining ten items will be developed and worked by the D & D Team as a future activity. The successful approach of the D & D Team will be duplicated with similar workshop(s) for the other three OCSG teams. An interesting lessons-learned was that the D & D activities could not be easily separated from the activities of the other three Teams since all contained overlapping elements.

June 2001 – OCSG Presentation at DOE P2 Conference

On June 20, OH participated in the special session sponsored by EM-22 and EM-54 at the DOE 2001 Pollution Prevention Conference. This session described the common elements of the OST and P2 programs, opportunities to enhance performance through collaboration, ongoing initiatives, and plans for the future. OH described the OCSG process for combining field OST and P2 resources to identify technology solutions and to facilitate implementation. OH and Oak Ridge helped identify the upcoming role of the EM-50 Accelerated Site Technology Deployment Process, where P2 projects using EM-50 technologies will be given special consideration as part of this program-wide integration effort.

UPCOMING KEY EVENTS

August / September 2001 – OCSG Working Meetings

The OCSG will hold working meetings as a follow on to the June D&D Project Managers Networking meeting, and will organize the other three teams in like manner.

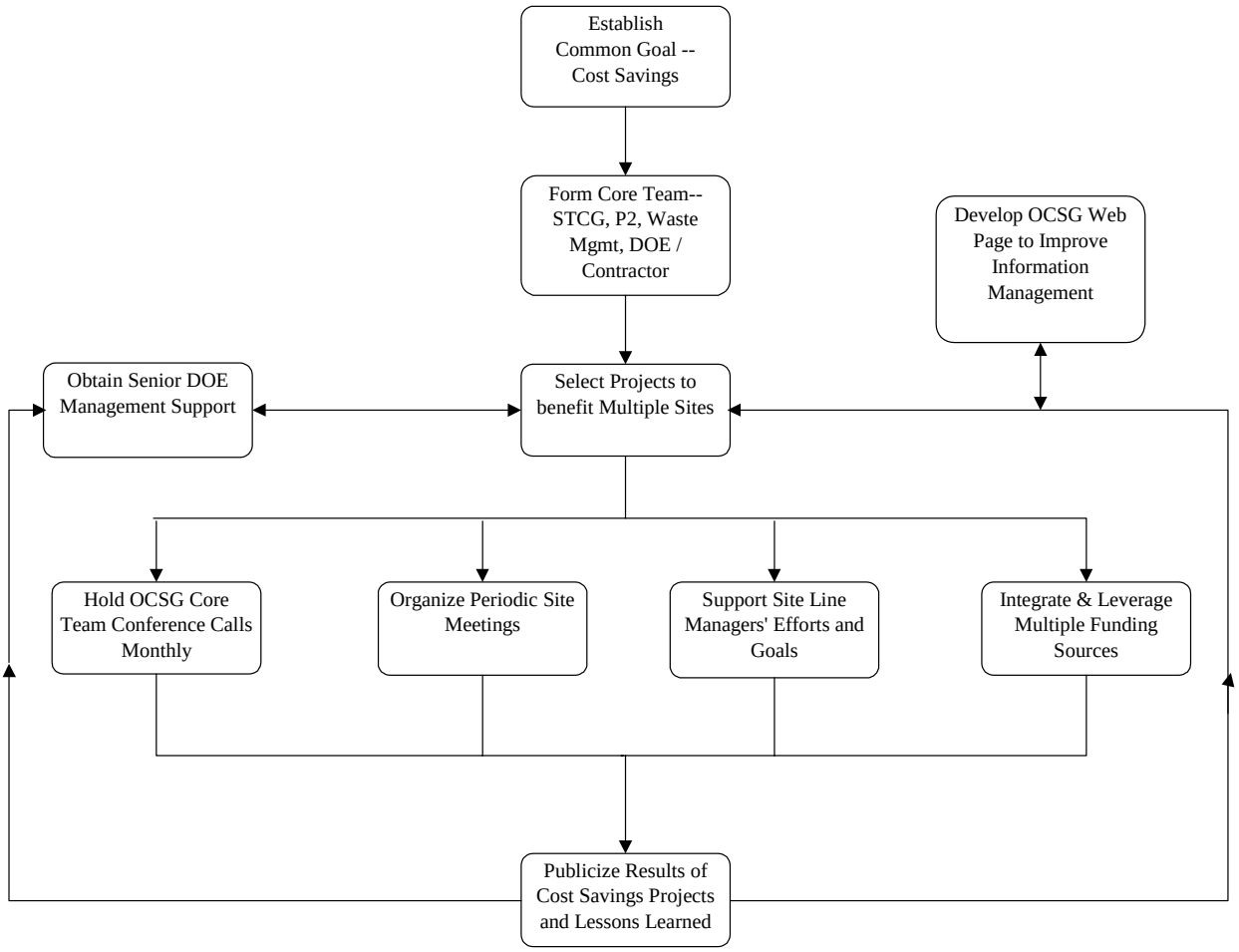
October 2001 – OCSG will host OH Focus Area Needs Meeting

The OCSG will host the upcoming OST Focus Areas Needs Meeting in early October. The emphasis will be on meeting the needs of specific OCSG projects rather than the normal approach of listing specific needs independently.

November 2001 – DOE TIE Workshop

OH expects to participate in the TIE Workshop in Albuquerque in November. OH has submitted two papers on the progress of the OCSG: 1) Reuse of Excess Equipment from D&D Activities by DOE Ohio Cost Savings Group; and 2) Combining Pollution Prevention with Technology Deployment: Generating Cost Savings Using the Department of Energy Ohio Cost Saving Group.

Flow Chart for Ohio Cost Savings Group Process



The OCSG Process for
Combining the Pollution Prevention and Technology Programs

The preceding flow chart depicts the steps the Ohio Cost Savings Group (OCSG) found successful in combining the P2 / WMin and Technology Programs to achieve improvements in the cost and schedule baselines of the five OH Project sites. The following provides additional information for each of these steps:

1. **Establish a Common Goal -- Cost Savings**
   The primary objective of the OCSG is to save time and money while completing cleanup projects. With tighter budgets, project managers at DOE sites are looking for effective ways to make their budgets stretch further. Early on, we agreed the best single metric for determining the success of OCSG projects and achievements is demonstrated Cost Savings / Cost Avoidance.

2. **Form a Core Team**
   An effective core team for cost savings projects requires a good mixture of DOE and contractor representatives. The OH core team is proving effective in working with project managers toward the common purpose of completing projects while reducing or maintaining cost and schedule. Our key site representatives or champions are invaluable in obtaining the attention of the appropriate site manager(s) and in promoting and accomplishing cost savings measures. Representatives from each of the five OH sites comprising the OSCG include:

   a. STCG personnel
   b. P2 personnel
   c. Waste management personnel
   d. Project Managers

3. **OH Cost Savings Projects must Benefit Multiple Sites**
   OCSG representatives identify needs common to multiple OH sites, formulate projects with technologies and/or approaches that could meet these needs and achieve cost savings. The four OCSG teams agree on priorities and actions to accomplish these projects and team with key site representatives who champion these efforts for individual projects.

4. **Obtain Senior DOE Management Support**
   Approval from both DOE and site contractor management was believed necessary to form and operate the OSCG. This critical support was obtained in the January, 1999 OH Summit Meeting . The periodic Summit Meetings involve OH-DOE Manager and staff plus the five DOE Project Directors and the Presidents of their contractor organizations. The group accepted the proposed concept and has remained supportive of the investment required to build and maintain this cooperative approach between the five sites.

5. **Conduct and Participate in Routine Conference Calls and/or Meetings with the Core Group**
   The OCSG conducts a monthly conference call with all members involved . The status of active OH cost savings projects are reviewed and other potential cost saving opportunities are identified and discussed. These calls are also used to convey the information obtained from the bi-weekly OST-

TPO and the monthly Waste Minimization Coordinators calls plus other information of general interest.

6. **Organize Periodic Group Meetings between the Core Team and Key Site Representatives**
   Periodic meetings between key site personnel, such as characterization managers, D&D project managers, property managers and the OCSG are necessary for proper functioning of the four OCSG Teams. These joint OCSG Team Workshops have resulted in more extensive review of and identification of common needs and solutions. State-of-the-Art technologies are presented and discussed at these meetings as a way to attract participants. A vendor who has deployed a technology judged to have potential application at other sites by the OCSG is invited to discuss his technology in detail.

7. **Support Site Line Organization Managers**
   Another critical element in the process is to communicate with line organization managers. The OCSG seeks to promote understanding and support resolution of common needs and issues from line managers at each of the five sites. This communications vehicle has helped ensure the OCSG is working on the right problems.

8. **Integrate / Leverage Funding from Multiple Sources**
   Making changes to active baselines often requires additional funding to gain site interest. The OCSG has succeeded in leveraging relatively small amounts of funding from multiple sources in order to get things started. These efforts have helped certain project activities to take place in spite of baseline budget constraints.

9. **Publicize Results of Cost Savings Projects and Lessons Learned**
   As the OCSG obtains results, we have documented and publicized our successes and lessons learned through the use of fact sheets, publications, and conference presentations. As the successes received more recognition, involvement and support from sites, field offices, headquarters and programs has continued to grow.

10. **Develop OCSG Web Page to Improve Information Management**
    Perhaps one of the most underestimated aspects to the success of any process is the management and distribution of information. The OCSG has developed an Internet site within the Ohio Field Office web site reached at (www.ohio.doe.gov). The OCSG site can be reached by clicking on the "Technology" button of the OH web site home page. The OCSG uses the site to more effectively communicate among sites and key OSCG members. Information on the OCSG cost saving measures, results of meetings, OH technology fact sheets, and other useful information are made available in this area for project personnel to access on an as-need-basis. The URL reference for a direct link to the OCSG web site is: http://www.osti.gov/p2technology